

REMARKS

As a result of the Office Action mailed on June 2, 2004, Applicant has amended claims 1, 4-5, and 7-8 in its response and has added new claims 9-10. Claim 6 was previously cancelled. Thus, claims 1-5 and 7-10 are pending in this application. The amendments to the claims were made simply for clarification purposes. New claims 9-10 are fully supported by the original specification, for example, by original claim 8 and at paragraph [0043 of the publication], respectively. No new matter has been added. Applicants therefore respectfully request that the Amendments be entered.

Claim 7 was objected to. Applicants have amended claim 7 to correct the typographical error -- the term "choroplastic" was replaced by the term "chloroplastic" as supported by the present specification at page 4, line 2. Applicants therefore respectfully request that this objection be withdrawn.

Claims 1-5 and 7-8 were rejected under 35 U.S.C. 112, first paragraph, for the reasons cited on page 2 of the Office Action. Applicants respectfully traverse this rejection.

Applicants appreciate the Examiner's acknowledgement that the specification enables one skilled in the art to determine the genetic material of cocoa from mitochondrial or chloroplastic DNA, seed storage protein gene and chitinase gene via a DNA detection technique, as taught by the working Examples. Applicants, however, stress that the present disclosure also broadly enables one skilled in the art to determine of genetic material of processed cocoa generally using DNA detection techniques well known in the art.

Applicants emphasize that the present claims are directed to a method of identifying genetic material in processed cocoa and not to a particular DNA sequence. Applicants invention is based on their surprising discovery that standard DNA identification techniques can be efficiently used to detect and identify the genetic material in fermented and roasted cocoa beans and food products contain the same, such as chocolate. Prior to Applicants discovery, the common belief was that the process steps involved in preparing cocoa -- fermentation, roasting, *etc.* -- significantly destroyed the DNA such that the processed cocoa DNA could not be successfully used to identify and control the genetic origin of fermented beans, roasted beans and chocolate. As set forth in the present application, it was generally accepted among those skilled in the art that cocoa DNA was destroyed by the commonly used processing steps like fermentation, drying and roasting, which is performed is typically performed at a temperature of 135° C for 30 to 40 minutes.

One skilled in the art clearly understands and is capable of using DNA identification techniques -- *e.g.*, PCR, RAPD, or RFLP -- to identify genetic material without undue experimentation. These techniques are well known and understood by one skilled in the art. Thus, there is nothing unpredictable about the use of these techniques by one skilled in the art. In light of Applicants' surprising discovery, one skilled in the art is now motivated and enabled to isolate and identify the presence of identifying cocoa genetic material with routine experimentation, using the DNA identification techniques well known and successfully used in the prior art.

Applicants' working examples -- detection of rDNA 5S gene, seed storage protein gene, or chitinase gene -- provide evidence that supports their findings that the genetic material of processed cocoa can be detected using well known DNA identification techniques contrary to the prior art. This is clearly demonstrated, for example, in Figs. 3 and 4 of example 5 of the present invention, showing that all samples tested were detected by a discrete band and that it is indeed possible to determine what raw material (type of cocoa bean) was used to make the end product. Applicants' invention is simple, but effective. There is nothing cited by the Examiner that would contradict the Applicants' findings or indicate that there is anything unpredictable about identifying genetic material in cocoa, or specifically processed cocoa as claimed by Applicants based on their experiments.

While some routine experimentation may be necessary to isolate and identify a particular cocoa sequence of interest, no undue experimentation would be necessary. This is especially true in view of Applicants' teachings and the fact that the level of skill in the art is high with regard to DNA identification techniques that were well known and effectively used at the time of the invention.

Applicants therefore respectfully request that this rejection for lack of enablement of the method claims be withdrawn.

Claims 1-5 and 7-8 were rejected under 35 U.S.C. 112, second paragraph, for the reasons cited on page 5 of the Office Action.

In an effort to expedite the allowance of the claims, Applicants have amended claims 4-5 and 7.

Applicants, however, respectfully traverse the Examiner's rejection of claims 1-5 and 7-8 as being "unclear [as to] how the method is done in terms of determining the genetic material of cocoa in fermented or roasted beans." As explained in detail above, one skilled in the art understands how to apply a DNA detection technique to determine the

genetic material of cocoa. The claim is not vague in light of the present specification and the understanding in the art.

Applicants therefore respectfully request that these rejections be withdrawn.

Claims 1-5 and 7-8 were rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,668,007 to Spencer *et al.* ("Spencer").

Applicants' presently claimed invention is directed to a method of determining the genetic material of processed (fermented/roasted) cocoa using DNA identification techniques. The crux of Applicants' invention resides in their surprising finding that in spite of the cocoa processing steps, the DNA obtained in the sample may still be effectively used to determine the genetic origin of the cocoa used to prepare the sample.

In contrast, Spencer pertains to a recombinant cocoa protein and precursor. In particular, a 21 kDa protein and its 23 kDa expression precursor, as the source of peptide flavor precursors in cocoa. The genes identified by Spencer have been sequenced and recombinant proteins have been synthesized. Additionally, the cDNA in Spencer may be used in restriction fragment length polymorphism (RFLP) analysis to detect DNA of a cultivars digested with restriction enzymes. Specifically, as evident, Spencer does not teach or even suggest Applicants invention.

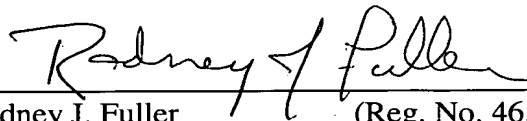
Applicants were the first to discover and teach that the state of the art DNA identification techniques are actually suitable to detect genetic material in processed cocoa beans and chocolate and that these techniques could efficiently be used to identify the genetic origin of the cocoa used. Spencer does not describe a method for determining the genetic material of cocoa in fermented or roasted beans, chocolate or a food component comprising roasted or fermented cocoa beans. Spencer fails to teach or even mention this surprising possibility discovered by the present inventors. Spencer further fails to teach or disclose a method of identifying the genetic material in processed cocoa. Without some teaching or motivation, Spencer cannot anticipate or for that matter make obvious Applicants presently claimed invention.

Applicants therefore respectfully request that this rejection be withdrawn.

In view of the foregoing remarks and amendments, it is believed that the entire application is now in condition for allowance. Should any issues remain, please call Rodney Fuller at (202) 371-5838 or Allan Fanucci at (212) 294-3311 in order to expedite the allowance of all the claims in this application.

Respectfully submitted,

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Rodney J. Fuller (Reg. No. 46,714)
For: Allan A. Fanucci (Reg. No. 30,256)

WINSTON & STRAWN LLP
Customer Number 28765

(202) 371-5838